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TITLE: Lock assembly for double door that can either hold two doors fixed together, or can selectively release two doors so that each door can swing independently, has handle which actuates locking mechanism, and actuates connection mechanism

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BASIC-ABSTRACT:

NOVELTY - The lock assembly includes a releasable locking mechanism that is

adapted to lock one or both of the two doors to the door frame, and also
includes a releasable connection mechanism that is adapted to releasably
connect the doors. An operating mechanism, e.g. a handle (16), is adapted to
allow a user to control both the locking mechanism and the connection
mechanism. Actuation of the operating mechanism by one predetermined movement
releases the locking mechanism, and actuation of the operating mechanism by a
second predetermined movement releases the connection mechanism.

USE - As a **lock** assembly for a double **door** e.g. in a portable home or **trailer**
having an outer door and an inner screen door.

ADVANTAGE - Is less likely to be damaged by flexing caused by high wind speed
passing door.

DESCRIPTION OF DRAWING(S) - The drawing shows and exploded view of the lock
assembly.

Handle 16

CHOSEN-DRAWING: Dwg.1/7

TITLE-TERMS: LOCK ASSEMBLE DOUBLE DOOR CAN HOLD TWO DOOR FIX CAN SELECT RELEASE
TWO DOOR SO DOOR CAN SWING INDEPENDENT HANDLE ACTUATE LOCK
MECHANISM ACTUATE CONNECT MECHANISM

DERWENT-CLASS: Q47

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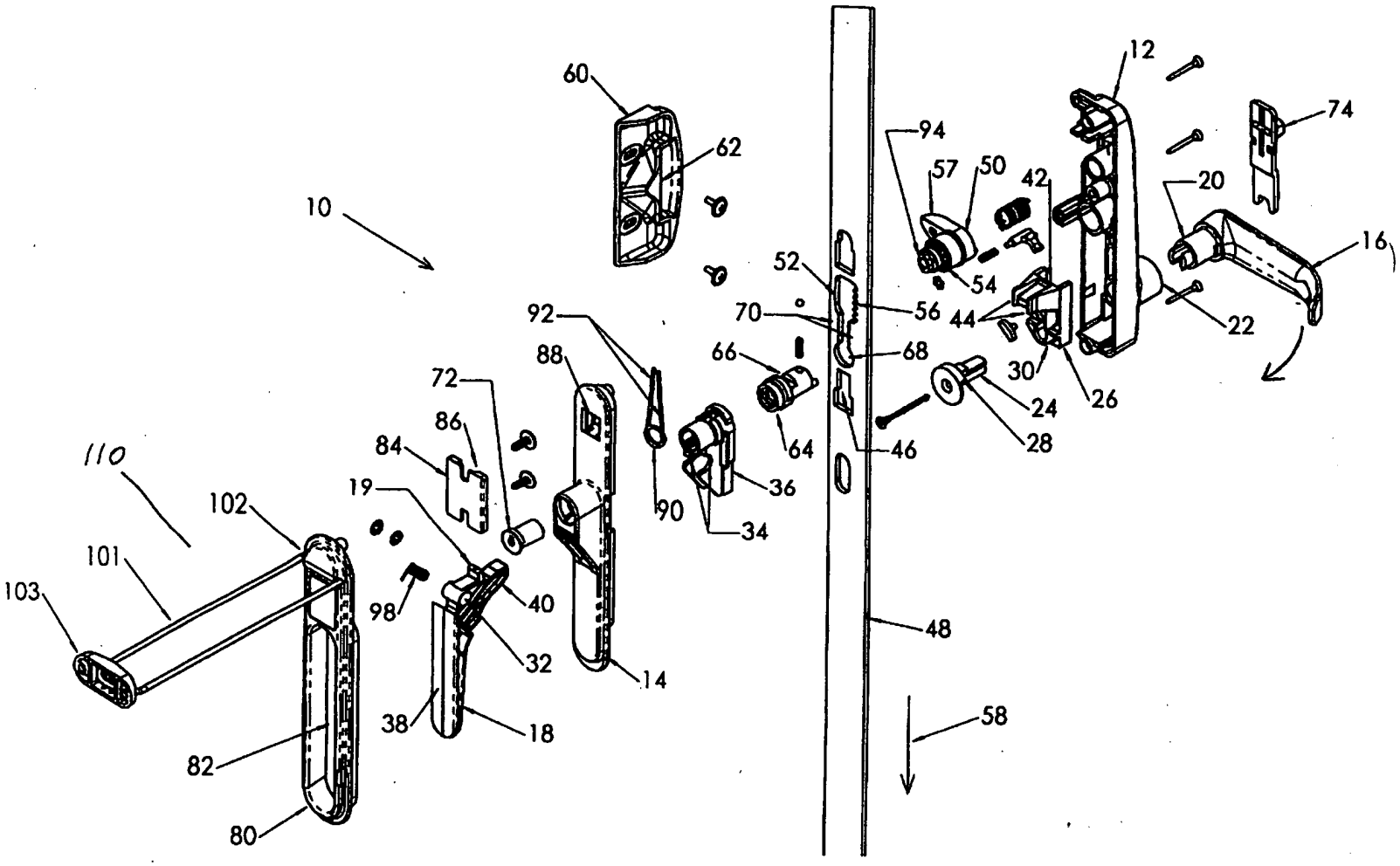
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ABSTRACT

DOUBLE DOOR LOCK ASSEMBLY

A lock assembly is provided for a double door. Such a double door would comprises a door frame and at least two doors. The lock assembly can either hold the two doors fixed together so that the two doors are able to swing in connected movement, or the lock assembly can selectively release the two doors so that each door can swing independently of the other. The lock assembly includes a releasable locking mechanism that is adapted to lock at least one of the two doors to the door frame, and also includes a releasable connection mechanism that is adapted to releasably connect the doors. An operating mechanism, such as a handle, is adapted to allow a user to control both the locking mechanism and the connection mechanism. Actuation of the operating mechanism by a first predetermined movement releases the locking mechanism, and actuation of the operating mechanism by a second predetermined movement releases the connection mechanism.

Regulation 3.2(2)

AUSTRALIA

Patents Act 1990

ORIGINAL
COMPLETE SPECIFICATION
STANDARD PATENT

Application Number:

Lodged:

Invention Title: DOOR LOCK ASSEMBLY

The following statement is a full description of this invention, including the best method of performing it known to us :-

DOOR LOCK ASSEMBLY

FIELD OF INVENTION

This invention relates to a lock assembly, and in particular to a lock assembly for a double door. The double door may include an inner and outer door, for example, being a solid door and a screen door, and both the doors in the double door mechanism may be hinged from a single axis or on two axes in close proximity.

PRIOR ART

An example of such a double door is commonly found in a portable home or caravan where economies of space and weight dictate a minimum of complexity and volume for such components as doors. Generally, the double door in a caravan or the like has both doors mounted on a single axis. The inner door may usefully be a screen door allowing ventilation, whilst the outer door is a solid door providing greater security. There are generally three configurations: (1) both doors closed; (2) the outer door open and the inner door closed; and (3) both doors open.

The first configuration is generally used for secured closure of the caravan and for travel, where it is most important that the doors both remain closed. It is desirable in this configuration to be able to lock both doors in the closed position for periods where the caravan is unoccupied, or security is otherwise required. The second configuration may be used for ventilated occupation of the caravan, so that the inner screen door is held in the closed position whilst the outer solid door is maintained in the open position. In the third configuration, the two doors are both open, and generally are not connected to each other.

It would be convenient for the doors to be selectively attachable to each other to enable simultaneous movement or independent movement as the operator of the door preferred. In Australian Patent No. 445489 there is described a lock for a double door assembly wherein a latch actuator is provided on the front face of the free end of its inner door to allow selective

separation of the inner and outer doors of the double door. The latch actuator is positioned such that when the inner door is in the closed position, the latch actuator is hidden from view by the doorway itself. This results in the situation where the inner door must be opened before the inner and outer doors can be separated from each other.

A further complication of many doors of this type is that, being of light weight material and somewhat flexible, high wind speed past the door, such as occurs during road travel in the case of a caravan, can cause the door to flex outwardly at points distant from the latching point of the outer door. This is commonly fixed at one point about half way between the top and bottom of the door at the free edge thereof, which in the case of Australian Patent No. 445489, is also the leading edge. The resultant flexing at the top and bottom of the door can result in permanent damage to the door.

OBJECT OF INVENTION

It is an object of the present invention to overcome, at least in part, one or more of the above disadvantages of the prior art, and/or to provide an improvement or alternative to existing double door closure arrangements.

SUMMARY OF INVENTION

According to the present invention, there is provided a lock assembly for a double door which includes a door frame and first and second doors both mounted at a first edge of each respective door, the lock assembly being operable either to hold the two doors in fixed relation for connected movement, or to selectively release the two doors for independent movement, the lock assembly including:

a releasable latching mechanism operatively adapted to releasably latch at least one of said two doors to the door frame;

a releasable connection mechanism operatively adapted to releasably connect the first door to the second door; and

an operating mechanism operatively adapted to control both the latching mechanism and the connection mechanism;

wherein actuation of the operating mechanism by a first predetermined movement actuates the latching mechanism; and

wherein actuation of the operating mechanism by a second predetermined movement actuates the connection mechanism.

Preferably, actuation of the operating mechanism by said second predetermined movement actuates both the latching mechanism and the connection mechanism.

Preferably, the latching mechanism and the connection mechanism share at least a common assembly having a latch portion and a release mechanism;

wherein actuation of the operating mechanism by said first predetermined movement actuates the common assembly such that the latch portion moves towards a state where the lock assembly is able to release said at least one door from the door frame; and

wherein actuation of the operating mechanism by said second predetermined movement actuates the common assembly so as to cause the releasable connection mechanism to move the connection mechanism between a connecting position and a non-connnecting position.

Preferred features of this aspect of the invention may be as defined in claims 4 to 8 as annexed hereto, the subject matter of these claims being included in the disclosure of the specification by this reference thereto.

According to another aspect of the present invention, there is provided a double door including a frame and first and second doors both mounted at a first edge of each respective door, the lock assembly being operable to hold the two doors in fixed relation for connected movement or to selectively release the two doors for independent movement, wherein:

actuation of an operating mechanism by a first predetermined movement allows selective release or latching of said first door with respect to said frame; and

actuation of said operating mechanism by a second predetermined movement allows selective release of said second door from connection with said first door.

Preferred features of the above discussed aspect of the invention may be as defined in claims 10 to 22 annexed hereto, the subject matter of these claims being incorporated into the disclosure of this invention by this reference thereto.

Several preferred embodiments will now be described with reference to the accompany drawings.

DRAWINGS

In order that the invention might be more fully understood, embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is an exploded view of an embodiment of a lock assembly;

Figure 2 is an exploded view of an additional latch mechanism for use with a further embodiment of the invention that has similar components to the embodiment of Figure 1;

Figure 3 is an elevational view showing operation of an internal lever in accordance with an embodiment of the present invention;

Figures 4(a) and 4(b) are perspective representations showing operation of an external lever in accordance with an embodiment of the present invention, Figure 4(a) showing the assembly in an unlocked state and Figure 4(b) showing the assembly in a locked state;

Figure 5a is a perspective cut-away view of the lock assembly as shown in Figure 4(a) in the unlocked state;

Figure 5b is a perspective cut-away view of the lock assembly as shown in Figure 4(b) in the locked state;

Figure 6 shows a perspective view of a further embodiment a lock assembly illustrated in an assembled state as part of a door, the further

embodiment having a catch member to prevent unintentionally locking of the assembly;

Figure 7 is a perspective view showing internal components of the catch member of Figure 6.

EMBODIMENTS

Referring to the drawings, Figure 1 shows an exploded view of a main lock assembly 10 for a double door. The double door consists of a door frame (not shown), and an inner door 11 and an outer door (not shown). The inner and outer doors are both mounted to the door frame at a first edge of each respective door.

In a first configuration, the lock assembly 10 disconnects and releases the two doors from one another so that each of the doors can swing independently from the other.

In a second configuration, the lock assembly 10 connects the first and second doors together. The two doors are held together by the lock assembly in fixed relation for connected movement, so that the inner and outer doors swing together as a single entity.

The ability to change between the first and second configurations is governed by features of the lock assembly 10.

Overview of Embodiment

The lock assembly has a releasable locking mechanism that includes latch 50. In Figure 1, the latch 50 is shown with the protruding latch portion 57 extending outwardly which enables it to engage a recess of a latch strike 62. With the latch in this position, the inner door can be locked to the door frame. Also, the latch 50 can be rotated to release the inner door from the door frame, as will be described.

The lock assembly also has a releasable connection mechanism which releasably connects the inner and outer doors together. This connection mechanism includes a recess (female) member 88 attached to the inner door, and a connector member 84 having a male protruding member 86 (hidden)

that is attached to the outer door. Thus, when the protruding member 86 connects to the recess member 88, this connects the inner and outer doors. The doors are disconnected when the recess member 88 releases the protruding member 86.

The lock assembly has an operating mechanism, in the form of internal handle 16. This single handle controls both the locking mechanism and the connection mechanism. Hence, by merely operating the handle 16, a user can engage and disengage the door from the door frame, and can also disconnect the inner and outer doors. Actuation of the handle by a first predetermined movement actuates the locking mechanism; and actuation of the handle by a second predetermined movement releases the connection mechanism, as will be described in detail below.

Details of Embodiment

The lock assembly has an internal face plate 12 and an external face plate 14 (for the inner door) which house internal components of the lock assembly. (Figure 6 shows how these face plates are fastened to the inner door).

The lock assembly also has the internal handle 16 and an external lever 18. Both the internal handle 16 and the external lever 18 are operable to allow opening of the inner door from the door frame (not shown) as described below.

In Figure 1, movement of the internal handle 16 actuates the latch 50 by means of a metal strip 48 which moves up and down.

The handle 16 includes a bush 20, which is rotatable within a socket 22. A spigot 24 fits through slider 26 and into the bush 20 of the internal handle 16. When the handle 16 is rotated downwards (as shown by the arrow), a notch 28 on the spigot 24 acts against a shoulder 30 of the slider 26 to cause the slider 26 to move downwards with respect to the face plate 12. A corresponding notch and shoulder on the opposite side of the spigot 24 and the slider 26 provide for similar downward movement of the slider 26 for when the internal handle 16 is rotated upwardly.

Movement of the external lever 18 also can actuate the latch 50 by

means of the same metal strip 48. On the external side of the inner door, the external lever 18 rotates about a spindle 32, which, in use, sits in recesses 34 of a mounting portion 36. As the handle portion 38 of the lever 18 is pulled in a direction away from the inner door (and therefore slightly upwardly), a cam portion 40 of the lever 18 moves in a downward direction and acts against a corresponding cam portion 42 of the slider 26.

Thus, the slider 26 can be actuated by either the internal handle 16 and the external lever 18, depending on whether the user is standing inside or outside the double door. This slider 26 communicates movement, from both the handle 16 and lever 18, to the metal strip 48. This can happen because projecting arms 44 of the slider 26 are mounted in an aperture 46 of the metal strip 48 which acts as a driver mechanism. As the slider 26 is mounted to the strip 48, vertical movement of the slider 26 causes similar vertical movement of the strip 48, and vise versa.

Up and down movement of the strip 48 is translated into rotational movement of the latch device 50 as follows: The latch device 50 engages with the strip 48 by being fitted into an aperture 52 in the strip 48. Teeth 54 located on the latch 50 are engaged with teeth 56 on the internal edge of the aperture 52. The latch 50 is fixed in lateral relation to the inner door. In other words, the only substantial movement of the latch 50 with respect to the inner door is rotational movement. As such, when actuation of the handle 16 causes the driver strip 48 to move downwards (indicated by pointer 58), the teeth 54 on the latch 50 interact with the teeth 56 of the aperture 52 in the strip. Thus, up and down movement of the strip 48 translates into rotational movement of the latch 50. In this way, the protruding latch portion 57 of the latch 50 can be selectively engaged with or released from particularly the recess 62 in the latch strike 60. The latch strike 60 is attached to a door jamb (not shown).

The lock assembly, being in a locked state, means that the latch portion 57 cannot be rotated, whereas, when the lock assembly is in an unlocked state, the latch portion 57 can be rotated.

When the lock assembly is in an unlocked state, a cylinder 64 is placed in an orientation with its cutaway portion 66 presenting a vertical face which is

arranged laterally of the cylinder 64. A further cutaway portion (not shown) is provided on the opposite side of the cylinder 64. In the "at rest" position of the lock mechanism (that is, when neither the handle 16 or the lever 18 is being activated - illustrated in Figures 3(a) and 4(a)), the cylinder 64 rests in the circular lower portion 68 of the aperture 52. When either the handle 16 or the lever 18 is actuated, the strip 48 is driven downwards and the protrusions 70 of the aperture 52 pass through the respective cutaway portions 66 on the cylinder 64. The lock assembly 10 is unlocked when the cutaway portions 66 are in this vertical alignment, because each cutaway portion 66, on either side of the cylinder 64, can slide up and down in the aperture 52. Consequently the strip 48 is able to move up and down, which means that the latch 50 can be rotated.

On the other hand, when the lock assembly is in a locked state, the cylinder 64 is placed in the orientation shown in Figure 1, with the cutaway portion 66 presenting a horizontal face. The assembly 10 is locked when the cutaway portions are in this horizontal alignment, because the cutaway portions 66 cannot slide up and down in the aperture 52. Consequently the strip 48 cannot move up and down, which means that the latch 50 cannot rotate.

Thus, it is the rotational orientation of the cylinder 64, or more precisely, the orientation of the cutaway portions 66 of the cylinder, that determines whether the lock assembly is in a locked or unlocked state, because the orientation of the cylinder determines whether the strip 48 can move up and down. The latch 50 is connected to the strip 48 by the teeth 54, 56, so the latch 50 can only rotate when the strip 48 is free to move up and down.

A person standing outside the door can lock the lock assembly 10, preferably when the door is in its closed position in the frame, by using a key. Locking of this main lock assembly 10 occurs when (in the "at rest" position) the lock barrel 72 is rotated following insertion of the key (not shown), causing rotation of the cylinder 64 to a position shown in Figure 1. Once the cylinder 64 is in this position within the lower portion 68 of the aperture 52, vertical

movement of the driver strip 48 is prevented by protrusions 70 in the aperture 52, thus preventing rotation of the latch 50, and thus causing locking of the inner door.

A person standing inside the door can lock the lock assembly 10, when the door is in its closed position in the door frame, without using a key by actuating a snib component 74. The snib is positioned on the internal side of the inner door, and is actuated by simply sliding the snib component 74 downwards, into the locked position. Moving the snib downwards does two things:

Firstly, it serves to rotate the cylinder 64 into the orientation (as represented in Figure 1) that locks and prevents movement of the driver strip 48. This effectively locks the lock assembly because the latch 50 is prevented from rotating.

Secondly, sliding the snib 74 downwards also serves to engage the handle 16 and prevent rotation thereof, thus preventing actuation of the driver strip 48, and locking the inner door. This prevents rotation of the handle 16 to make it clear to the person that the assembly is locked. (If the handle were to be allowed a substantial degree of "play" when in the locked state, it might give the person the false impression that the assembly was not locked, when it was in fact locked).

The protruding latch portion 57 is spring loaded to extend outwardly. When the door is to be locked to the door frame, this latch portion 57 is momentarily rotated upwards and out of the way as the latch portion 57 slides on an inclined ramp-like surface on the door strike 60, in order that the door can close in the door frame. Once the latch portion 57 engages the recess 62 in the latch strike 60, the latch portion 57 is resiliently urged back to its outwardly extended position to cause the door to be held fast in the door frame. Thereafter, the lock assembly 10 can be locked to secure the door in the door frame.

The lock assembly 10 is placed in a locked state (where the latch 50 cannot rotate and is held rigidly in the outwardly extended position). Usually, a user will lock the lock assembly only when the door is positioned in the door

frame, so that the latch portion 57 can engage the recess 62 which is located on the door frame. A situation to be preferably avoided is where the lock assembly could be unintentionally placed in this locked state when the door is not positioned in the frame (when it is swinging freely). In order to prevent unintentional locking of the lock assembly, a further embodiment of the invention is provided with a catch mechanism 63 shown in Figure 6. The internal details of the catch mechanism are shown in Figure 7.

In Figure 7, the catch mechanism 63 includes a catch 69 that is resiliently urged (in the direction of the arrow) into a notch 65 in the snib 74. The notch 65 can be on either side of the snib depending on whether the lock is operating in a left or right hand configuration. In this further embodiment, the snib 74 can only move up and down, if the catch 69 is depressed in order to displace the catch 69 from the notch 65. Hence, the catch mechanism 63 provides a measure of safety by preventing the snib 74 from being slid downwards into the locked position unless the catch 63 is first depressed. It is intended that the lock assembly 10 will be placed in the locked configuration only when the inner door, as in this example, is in position in the door frame in a closed position. In other words, it is intended ideally that the user will only depress the catch 63 when the door is closed in the door frame. Of course, it is possible to place the lock assembly into the locked state even when the door is swung open, but the need for the catch 63 to be depressed, before the lock assembly is locked, means that the user is less likely to lock the assembly 10 unintentionally.

Turning now to components that are attached to the outer door, there is provided a face plate 80 on the outer door (not shown), which includes an aperture 82. When the inner and outer doors are connected, the lever 18 protrudes through the aperture 82 and thus allows access to the lever 18 and the lock barrel 72 from the external side of the outer door, as seen in Figures 4(a) and (b).

As discussed above, the internal face of the outer door is provided with the connector member 84, which includes the male protruding member 86. When the inner and outer doors are pushed together, the male protruding

member 86 is received in the recess (female) member 88 of the face plate 14.

A resilient biasing means is provided in the form of a spring 90 mounted, in use, on the rear of the face plate 14 receives the male member 86 between the legs 92 of the spring 90 to secure or connect the inner and outer doors together. When the spring 90 is closed, the male protruding member 86 can be caught between the legs 92 of the spring. When the legs 92 of the spring 90 are moved apart, the male protruding member 86 can disengage from the spring 90. It is thus the closing and opening of the spring 90 that allows the inner and outer doors to connect and disconnect.

In Figure 1, the illustrated spring 90 is U-shaped. The actual shape of the resilient means is variable provided it can perform the function of releasably catching the male member.

It will now be described how actuation of the handle 16 can affect the opening and closing of the spring 90, thereby enabling the doors to be disconnected by operation of the handle 16.

As discussed above, actuation of the handle 16 causes the latch member 50 to rotate. The latch 50 is provided with a cam member 94. When assembled, this cam member 94 on the latch 50 is also received between the legs 92 of the spring 90. When rotated sufficiently, the latch 50 is operable to cause the legs 92 of the spring 90 to move apart from each other to the degree required to release the male protruding member 86 caught between the spring legs 92.

It will now be described how actuating the handle 16 in a downwards (intuitive) manner merely rotates the latch 50 by an amount sufficient to for the door to disengage from the door frame, but insufficient to spread the spring legs 92 apart to the degree required to separate the doors. Whereas, rotation of the handle upwards (counter-intuitive) causes the rotation of the latch 50 by an amount sufficient to both release the door from the door frame, as well as to open the spring legs 92 to separate the doors.

The cam 94 is generally oval-shaped, as shown in Figure 1. The cam 94 is positioned between the spring legs 92. It can be appreciated that the cam 94 will only spread the spring legs 92 to a maximum extent when the

elongated axis of the cam 94 moves towards a horizontal orientation. When the elongated axis of the cam 94 is oriented in a vertical alignment, the cam will not force the spring legs 92 apart to as great a degree. As discussed above, it is the movement of the latch 50 with respect to the recess of the latch strike 62 that locks or unlocks the door to the door frame. Now it is seen that the degree of movement of the cam 94, on the latch 50, also determines whether the spring legs 92 are opened to the degree required to release the male protruding member 86.

The latch 50 has the protruding latch portion 57, and the cam 94. The latch 50 acts as a common assembly which is shared by the locking mechanism and the connection mechanism.

Downwards actuation of the handle 16 causes the latch portion 57 to move so that the door can be engaged and disengaged with the door frame. Upwards actuation of the handle 16 also causes movement of the latch portion 57, but in addition, also causes the cam 94 to move the connection mechanism between a connecting position and a non-connnecting position, so that the doors can be disconnected from one another.

Under normal opening and closing operation of the inner door, the male member 86 remains engaged by the spring 90, and thus the inner and outer doors remain connected.

However, if the latch 50 is rotated sufficiently, the cam will be rotated sufficiently such that the male member 86 will be released by the outward movement of the spring legs 92 caused by the action of the cam member 94 against the legs 92, allowing the inner and outer doors to separate and disconnect for independent operation.

In terms of the degree of rotation of the handle 16 required to effect operation, a downwards rotation of approximately 45 degrees will be sufficient to operate the latch to allow the opening of the inner door from the door frame, whilst an upwards rotation of approximately 90 degrees of the handle 16 would be required to cause release of the outer door from the inner door. To prevent undesired disconnection of the two doors, the downwards movement of the handle 16 is limited by a stop (not shown) to 45 degrees, as

illustrated in Figure 3(b). As such, under normal operation (downwards rotation), the door may be opened and closed from the door frame without unintentionally disconnecting the outer door from the inner door. The movement of the lever 18 is also limited to prevent sufficient rotation of the latch 50 that would cause release of the inner door from the outer door from the external side of the doors.

Release of the interconnection between the inner and outer doors is attained by upwards (or counter-intuitive) rotation of the handle 16 through an angle of approximately 90 degrees, as illustrated in Figure 3(c). The inner and outer doors can be reconnected to each other by simply pushing the two doors together so that the male member 86 enters the recess 88 and is held by the spring 90.

The rationale behind this design is that most people are conditioned to open a door by downwards rotation of the handle. Hence, rotating the handle 16 in a downwards direction merely opens the door (disengages the door from the door frame). Hence, it requires a non-intuitive decision to rotate the handle 16 in an upwards direction to separate the inner and outer doors. Hence, the user will not be surprised by the inner and outer doors separating when turning the handle in the usual downwards manner.

The above description relates to a latch 50 that is usually located at the mid-height of the door, as is the usual location for door handles. The embodiment described above has one locking point. However, when embodiments of the present invention are used, for instance, in caravans that have door frames that are not particularly rigid, embodiments of the lock assembly may have two or more latches or locking points as required. Thus, a further embodiment of the invention will be described that incorporates three latches, by way of example: one mid-height latch as is usual, together with another latch located in the upper region of the door, and a further latch for the lower region of the door. Having three latches enables the doors to be locked to the door frame at three points. The further embodiment provides a means of using the single handle 16 to synchronise the movement of the three latches.

In the above description, it was seen that the strip 48 translated the rotational movement of the handle 16 to the middle latch 50. In the same manner, the strip 48 can be used to translate the movement of the handle 16 to the upper and lower latches. To do this, the driver strip 48 of this further embodiment extends upwardly and downwardly of the section shown in Figure 1. The downward extension strip 96 of the strip 48 is illustrated in Figure 2, which shows an exploded view of an additional latching assembly 100. Thus, the strip 48 is almost the height of the entire door. In Figure 2, the extension strip 96 is actually the downward extension of the strip 48 of Figure 1.

Figure 2 shows the additional latching assembly 100 which includes an internal face plate 172 for the inner door, an external face plate 114 also for the inner door, and a connector member 184 for the internal face of the outer door. The connector member 184 includes a male protruding member 186 (hidden from view) which protrudes through a recess 188, and engages with the legs 192 of a further spring 190. Thus, the male member 186 of Figure 2 engages with the recess 188, in a similar manner to the engagement of the like components shown in Figure 1.

In Figure 2, a further latch member 150 includes gear teeth 154 and a further cam member 194. The downward extension strip 96 of the strip 48 includes an aperture 152 with gear teeth 156. An additional strike plate member 160 is provided on the door frame (not shown) so as to receive the further latch member 150 in the recess 162.

The additional latching assembly 100 operates in the same manner as the latching mechanism described above with regard to Figure 1. The downwards movement of the driver strip 48, not only causes rotation of the latch 50, but also causes the rotation of the further latch member 150, allowing opening of the inner door on a first given movement of the driver strip 48, and allowing release of the outer door from the inner door on a further given movement of the strip 48.

A corresponding assembly (not shown) is also provided on the upper portion of the driver strip 48.

The three latching assemblies -- the main assembly 10, the lower assembly 100 and the upper assembly (not shown) -- provide greater security by provision of three locking points between the inner door and the door frame, and three connection points between the inner door and the outer door. Flexure of the doors during travel is also greatly reduced, avoiding undesirable damage to the doors and the lock assembly.

In Figure 1, the inner door face plate 14 is attached to the front surface of the inner door 11. The outer door external face plate 80 is attached to the front surface of the outer door 13.

Turning now to Figures 4(a) and 4(b) , there is shown perspective views of the external aspect of the lock assembly as assembled and illustrating the relative positioning of the inner door external face plate 14 (hidden from view in Figure 4), the outer door external face plate 80, the lever 18 and the lock barrel 72 when the inner and outer doors are in the connected configuration.

Figure 4(a) illustrates the unlocked "at rest" configuration, and Figure 4(b) illustrates the locked configuration.

Figure 5(a) is a cut-away perspective view that corresponds to Figure 4(a), while Figure 5(b) corresponds to Figure 4(b). (In Figures 5(a) and (b), the strip 48 is not shown in order to show the arrangement of the other internal components).

In Figures 1 and particularly Figures 5(a) and (b), the external lever member 18 has an upper "follower" surface 19 that interacts with a cam surface 21 that is located on the cylinder 64 (see Figure 5).

The lock barrel 72 operates the lock cylinder 64. Operation of a suitable key in the lock barrel 72 causes the rotation of the lock cylinder 64.

In the unlocked configuration shown in Figure 5(a), the lock cylinder 64 is oriented such that its cam surface 21 urges the lever 18 outwards into the position shown in Figure 5(a) by acting on the upper "follower" surface 19 of the lever member 18. In this extended position, the lever 18 may be operated to open the latch mechanism to allow opening of the inner door by rotating the lever 18 upwardly and outwardly from the connected doors in the manner

described above. This causes the upper "follower" surface 19 of the lever 18 to move away from the cam 21 on the cylinder 64.

In the locked configuration shown in Figure 5(b), the lock cylinder is now oriented such that its cam surface 21 recedes. In other words, when the lock barrel 72 is operated to lock the lock assembly 10, the resultant rotation of the cylinder 64 causes the cam 21 on the cylinder 64 to recede in an upwards direction, allowing the spring 98 to act on the lever 18 to position the lever 18 in the configuration shown in Figure 4(b), that is, essentially in a plane with the external face plate 80 of the outer door. In this way, it is apparent to the external viewer (user) that the door is locked, and the lever 18 is removed from the possibility of accidental breakage as objects move past the door.

Also shown in Figure 1 is an attachment device 110 for selectively connecting the outer door to the structure to which the doors are attached, in this case a caravan. The purpose of the attachment device 110 is to hold the outer door (and the inner door if they are attached to each other) in the fully open position by attaching it to the outer wall of the caravan. This is commonly achieved by the use of a free-hanging hook and socket arrangement. In this example, however, a loop member 101 is attached at its upper end 102 to the outer door face plate 80. The loop may be snugly fitted in folded position, as shown in Figure 4, or may be extended (as shown in Figure 1) to be connected with a connector portion 103 which is connected to the wall of the caravan (not shown). This avoids problems associated with a free-hanging hook, and has the additional advantage that the doors can not be locked shut by the free-hanging hook from the outside when persons are located inside the caravan.

The embodiments have been advanced by way of example only, and modifications are possible within the spirit and scope of the invention as defined by the appended claims.

For example, the invention can be embodied in either right or left hand versions, which means that the directions of rotation described above in relation to the exemplary embodiments can be modified to change between a

right and left hand configuration for the lock assembly.

In the embodiments, the latch portion of the lock assembly has been located on the inner door, but in other embodiments the latch can be on the outer door.

The invention, in its broadest aspect, is not limited to the particular mechanisms used to translate motion from the handle to the latch, and it is conceivable that the person skilled in the art will be able to arrive at other mechanisms that fulfil the same function. For instance, instead of the strip 48, an elongated rod or a series of linkages might be used.

Furthermore, the invention, in its broadest aspect, is not limited to the particular mechanisms used to lock and release the inner door to the outer door. Instead of a cam 94, a wedge member might be used to spread apart the spring legs 92. Also, instead of a spring 90 and a protruding male member 86, a configuration might be used that does not require a spring, such as a rod and bolt configuration.

The invention is not limited to doors used in portable homes or caravans, and may be used in normal doors in buildings.

In the exemplary embodiments, the common assembly consists of a device having the latch portion and the cam portion, but in other embodiments, the common assembly can consist of components that are connected but spread apart to a slightly greater degree, and not all found on a single component.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A lock assembly for a double door which includes a door frame and first and second doors both mounted at a first edge of each respective door, the lock assembly being operable either to hold the two doors in fixed relation for connected movement, or to selectively release the two doors for independent movement, the lock assembly including:

a releasable latching mechanism operatively adapted to releasably latch at least one of said two doors to the door frame;

a releasable connection mechanism operatively adapted to releasably connect the first door to the second door; and

an operating mechanism operatively adapted to control both the latching mechanism and the connection mechanism;

wherein actuation of the operating mechanism by a first predetermined movement actuates the latching mechanism; and

wherein actuation of the operating mechanism by a second predetermined movement actuates the connection mechanism.

2. A lock assembly according to claim 1 wherein actuation of the operating mechanism by said second predetermined movement actuates both the latching mechanism and the connection mechanism.

3. A lock assembly according to claim 1 or claim 2 wherein the latching mechanism and the connection mechanism share at least a common assembly having a latch portion and a release mechanism;

wherein actuation of the operating mechanism by said first predetermined movement actuates the common assembly such that the latch portion moves towards a state where the lock assembly is able to release said at least one door from the door frame; and

wherein actuation of the operating mechanism by said second predetermined movement actuates the common assembly so as to cause the releasable connection mechanism to move the connection mechanism between a connecting position and a non-connnecting position.

4. A lock assembly according to claim 3 wherein the connection mechanism includes a resilient biasing means located on one of the doors and a connector located on the other of the doors,

wherein, when the doors are connected, the resilient biasing means holds the connector, and

wherein actuation of the operating mechanism by said second predetermined movement causes the release mechanism to actuate the resilient biasing means to free the connector therefrom.

5. A lock assembly according to any one of the preceding claims wherein the first predetermined movement is in a direction that is different to the second predetermined movement.

6. A lock assembly according to claim 3 wherein the common assembly includes a component that is rotatable by said operating mechanism.

7. A lock assembly according to any one of the preceding claims wherein the connection mechanism connects the first door directly in touching contact with the second door.

8. A lock assembly according to any one of the preceding claims wherein the releasable latching mechanism of the lock assembly is governed by a safety device that must be deactivated before the lock assembly can be locked.

9. A lock assembly for a double door including a frame and first and second doors both mounted at a first edge of each respective door, the lock assembly being operable to hold the two doors in fixed relation for connected movement or to selectively release the two doors for independent movement, wherein:

actuation of an operating mechanism by a first predetermined movement allows selective latching or latching of said first door with respect to said frame; and

actuation of said operating mechanism by a second predetermined movement allows selective release of said second door from connection with said first door.

10. A lock assembly according to claim 9 wherein the two doors are co-mounted on the same axis, and are mounted on common hinge pin means.

11. A lock assembly according to claim 9 or 10 wherein a first latch is provided which interacts with the door frame to hold the first door in fixed relation to the door frame.

12. A lock assembly according to claim 11 wherein actuation of the operating mechanism acts to rotate the latch to selectively engage or disengage the frame.

13. A lock assembly according to claim 12 wherein a further mechanism is provided on the first latch so that further rotation of the first latch beyond that required for release of the first door from the door frame is operable to release the connection between the first and second doors.

14. A lock assembly according to claim 13 wherein the further mechanism is in the form of a cam on the latch component which opens a spring clip used to connect the two doors together.

15. A lock assembly according to claim 14 wherein the spring clip is a simple u-shaped clip which selectively engages an arrow shaped protrusion mounted on the second door.

16. A lock assembly according to claim 11 wherein rotation of the first latch causes vertical movement of a driver mechanism which operates at least one additional latch to provide multiple latching points for the first door to the frame.

17. A lock assembly according to claim 16 wherein a connection point between the two doors is provided associated with each said additional latch.

18. A lock assembly according to claim 16 or claim 17 wherein the additional latch or latches are rotated in a similar manner to the first latch so as to act synchronously with the first latch.

19. A lock assembly according to any one of claims 16 to 18 wherein the driver mechanism is in the form of a strip with gear teeth set at appropriate locations in the strip to interact with corresponding gear teeth on each of the latches.

20. A lock assembly according to claim 19 wherein, when the strip is driven longitudinally by rotation of the first latch, the additional latches are simultaneously rotated.

21. A lock assembly according to claim 11 wherein the first latch includes first drive means engageable with second drive means on a metal strip to move said metal strip in a longitudinal direction upon rotation of said first latch towards a release position.

22. A lock assembly according to claim 21 wherein the lock mechanism is locked by rotation of a locking cylinder within the metal strip which may selectively prevent said longitudinal movement of the metal strip, thus preventing releasing operation of the first latch.

23. A lock assembly substantially as hereinbefore described and illustrated with reference to each of the embodiments shown in the accompanying drawings.

DATED this 19th day of January 2004

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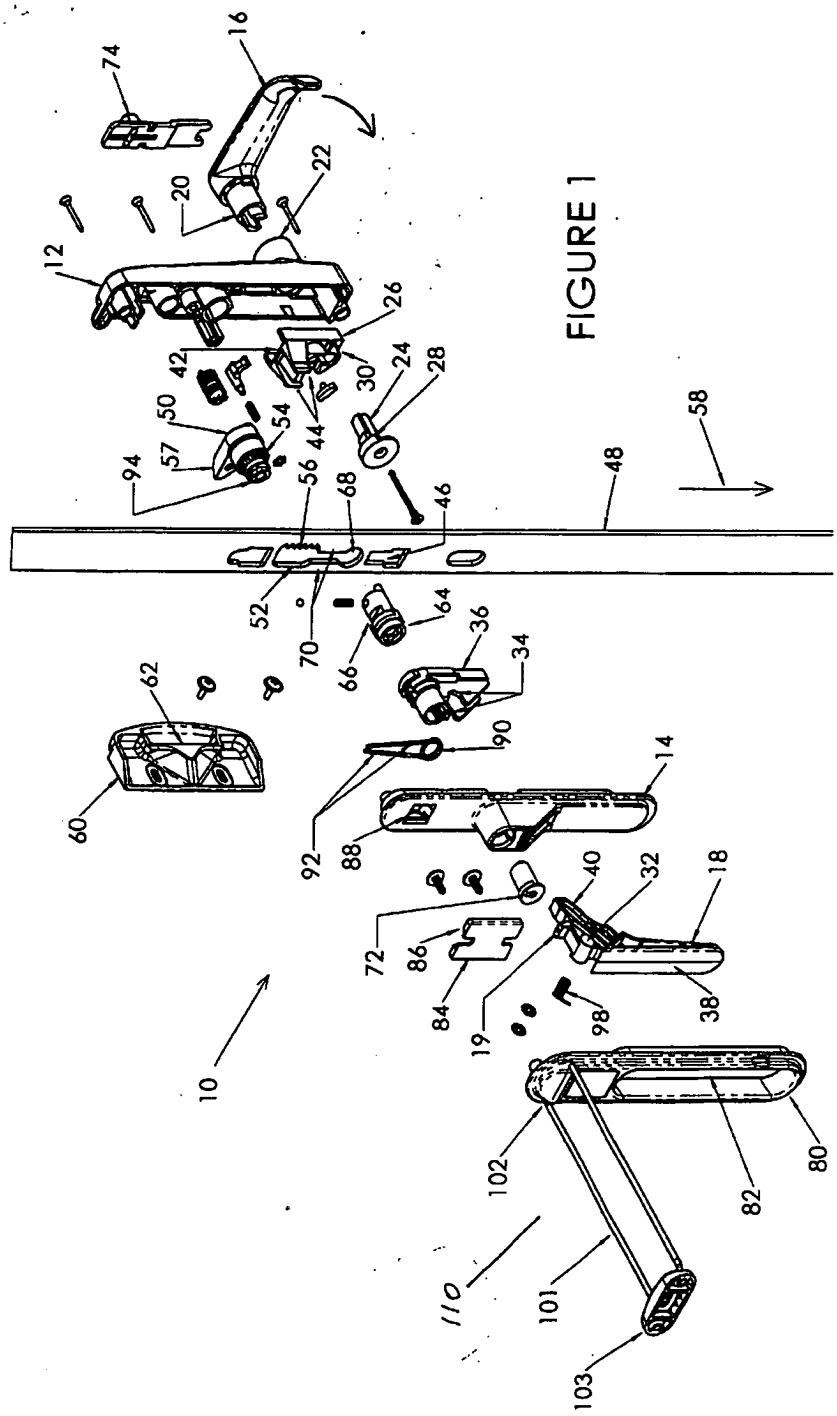
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FIGURE 1

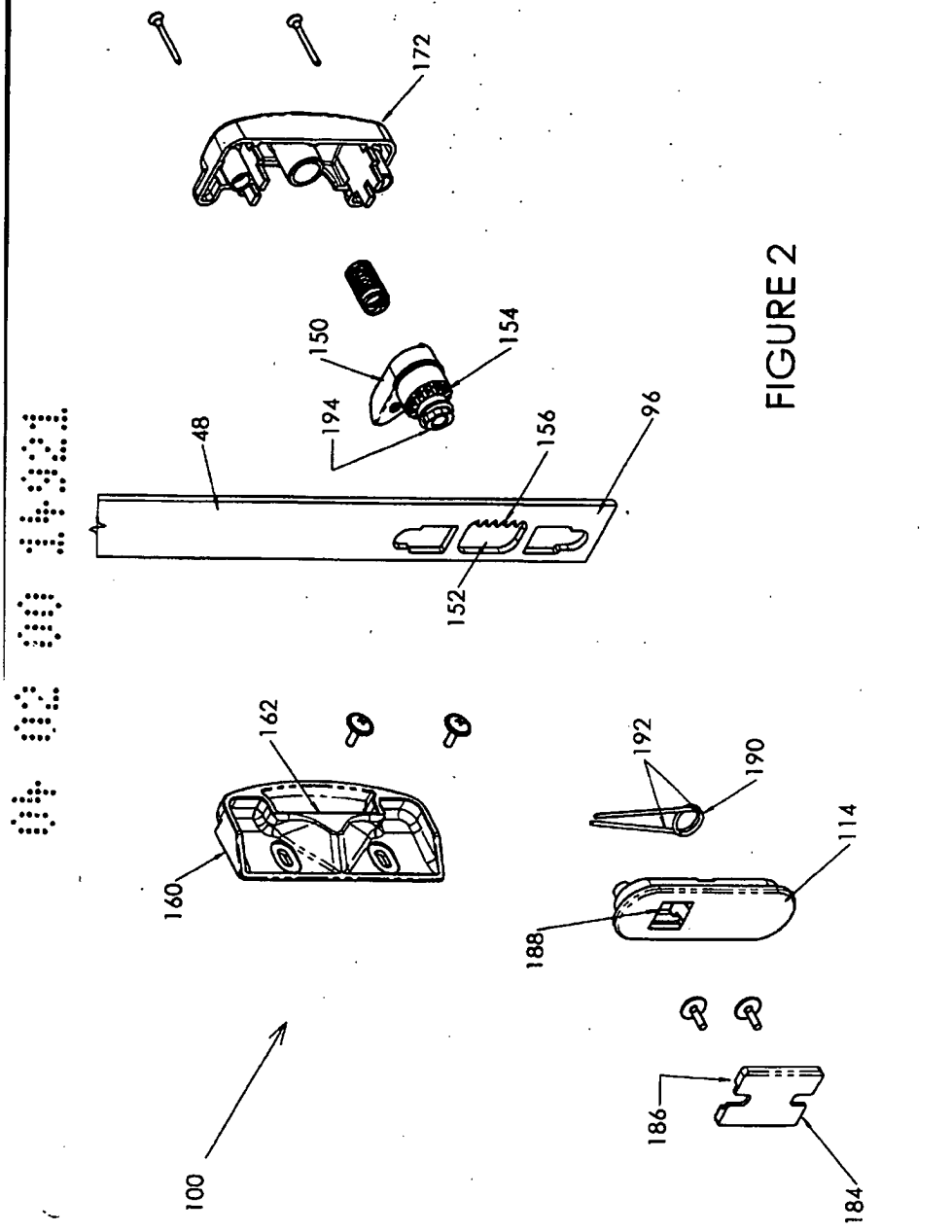
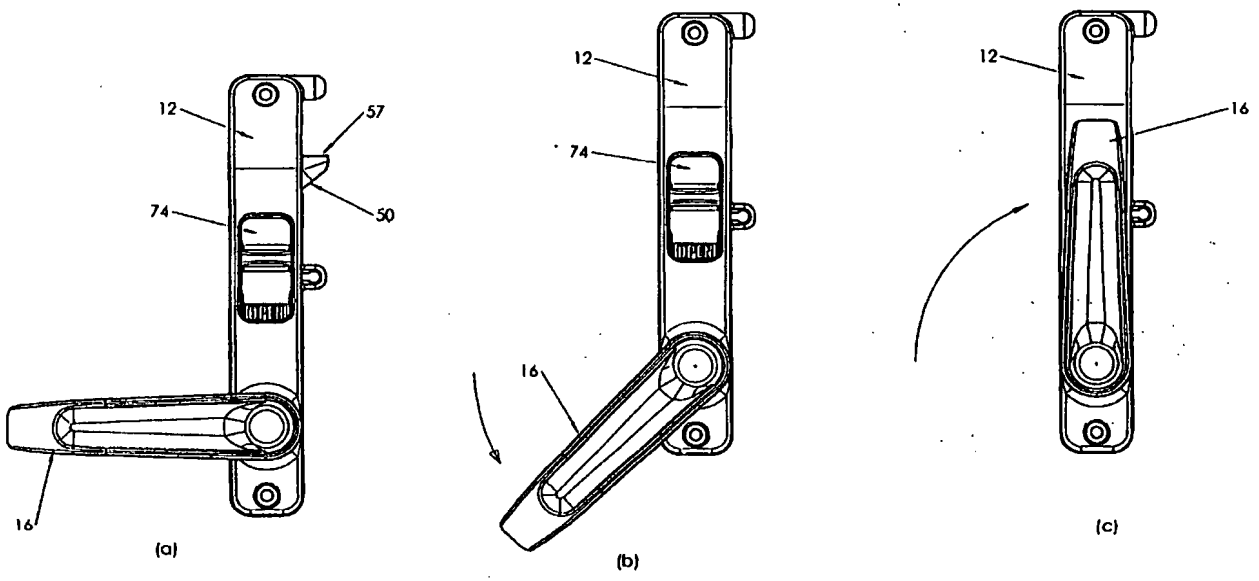


FIGURE 2



HANDLE IN CLOSED POSITION

HANDLE IN DOOR OPEN POSITION

HANDLE IN DOOR SEPARATION POSITION

Figure 3

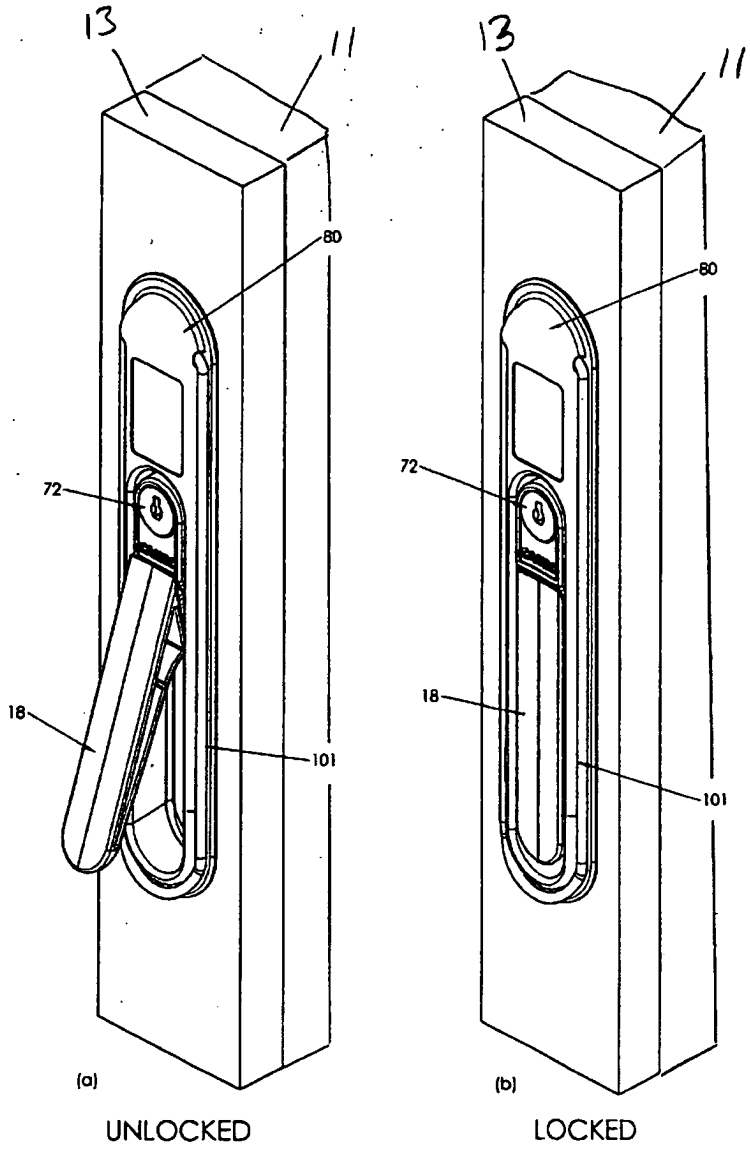


Figure 4

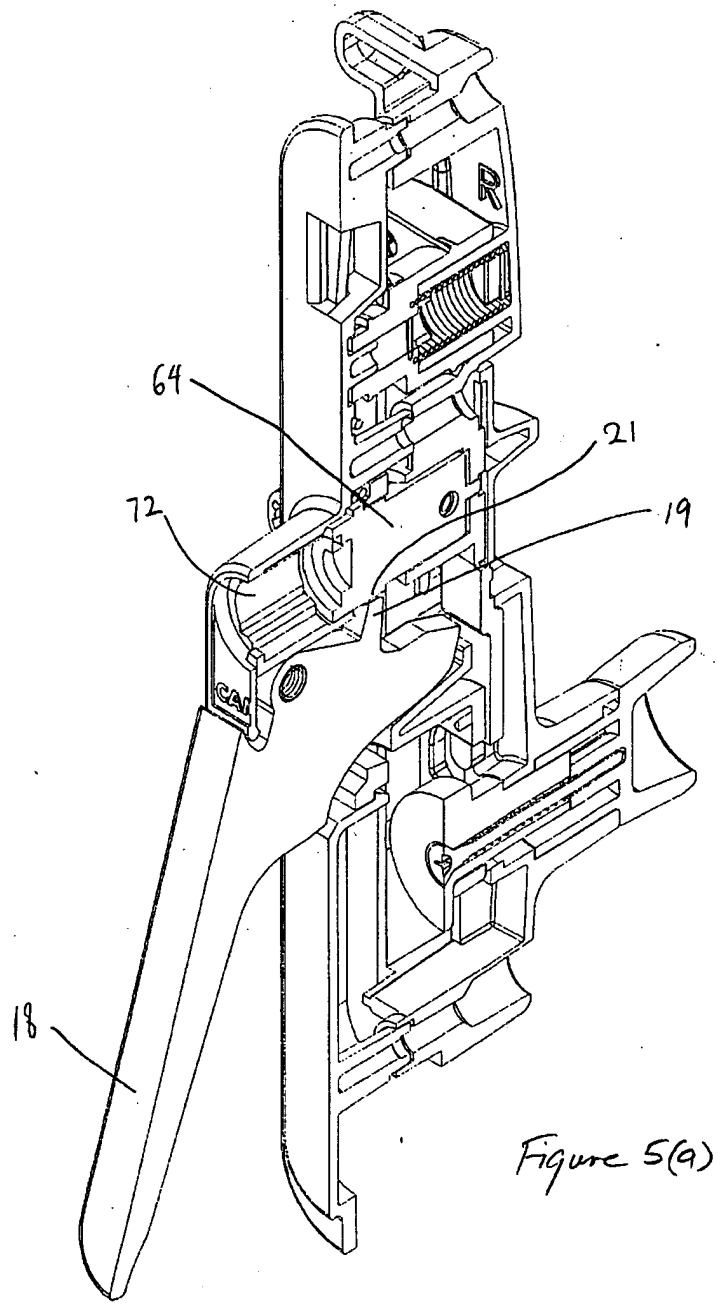


Figure 5(a)

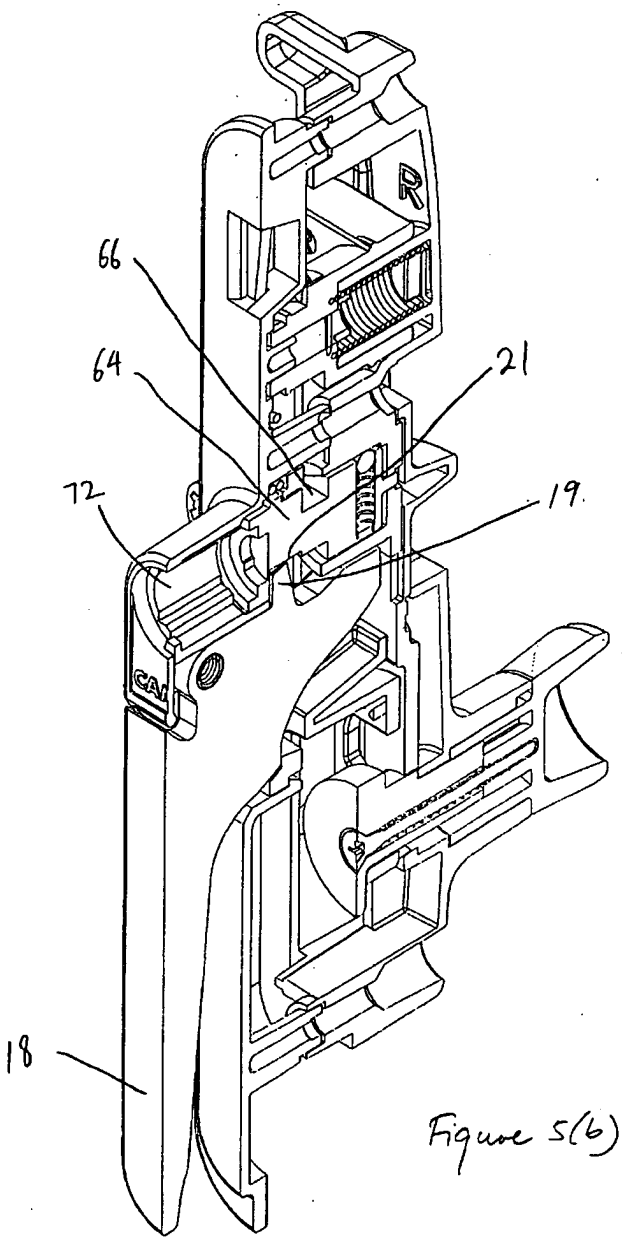


Figure 5(6)

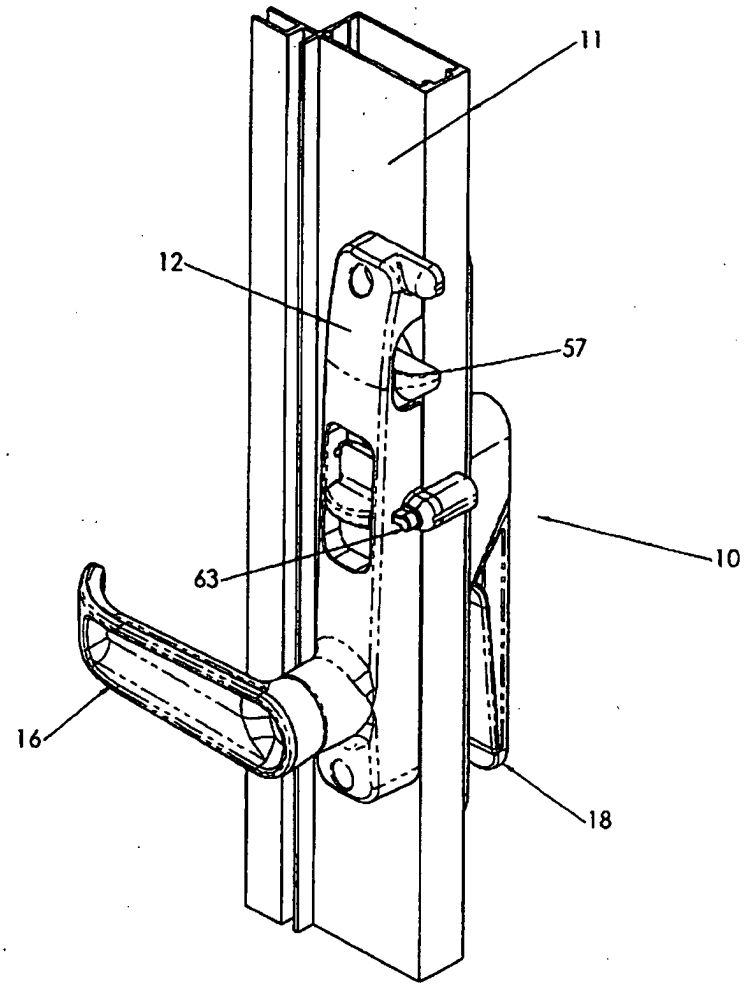


FIGURE 6

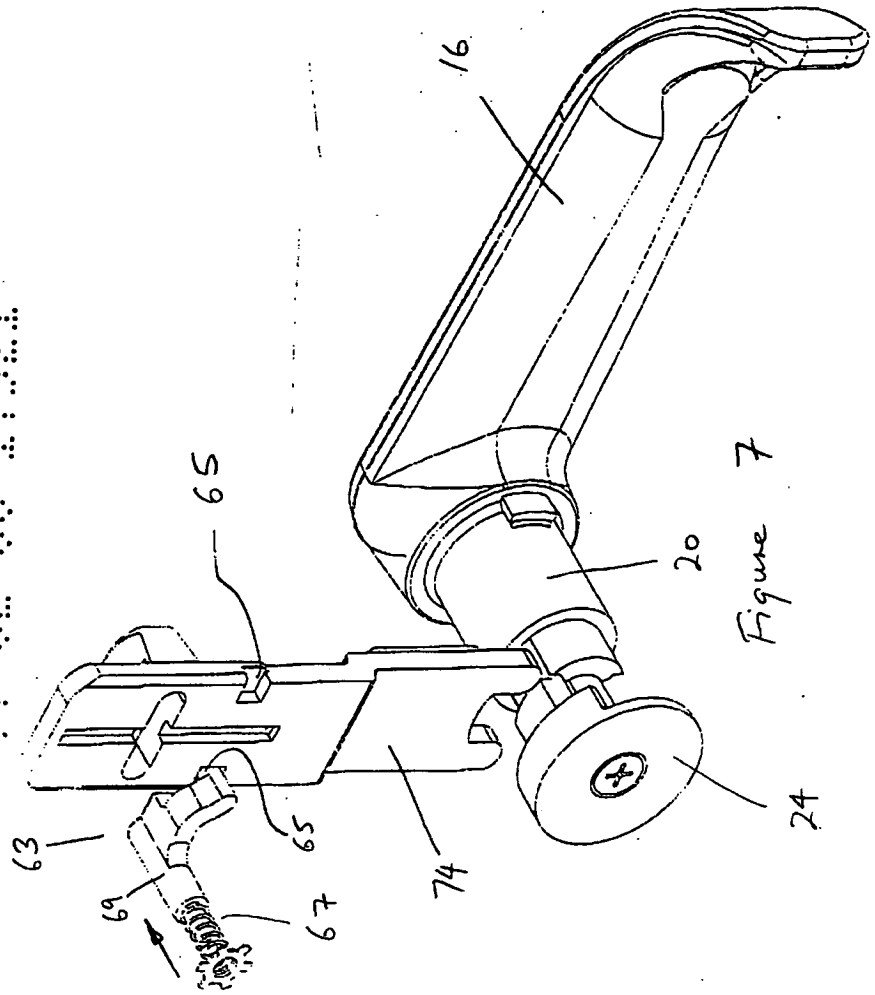


Figure 7